Abstract Title: **Identity and Classroom Culture as Lenses for Understanding Student Success**

MSP Project Name: Mobilize: Mobilizing for Innovative Computer Science Teaching and Learning

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120 word summary:

Mobilize builds on teenagers' engagement, creativity and dexterity with mobile technology. At the heart of Mobilize is the CENS Participatory Sensing system - an innovative method of data collection and analysis in which students use mobile phones and web services to collect and interpret data about issues important to them.

We hypothesize that Mobilize's innovative approach to engaging students in real-world, self-authored campaigns will make data collection and interpretation relevant to individual students and their collective causes, and will facilitate classroom norms and practices that afford opportunities for students to develop identities that embody proficiency in the "culture of power," a sense of self as a "doer" and creator of a discipline, cultural relevance, and critical consciousness.

- Section 1: **Questions for dialogue at the MSP LNC**.

1. How does identity provide a lens to study student success as a co-construction of students a.) becoming proficient in the "culture of power" (Delpit, 1995), b.) seeing themselves as capable "doers" and creators of the discipline, c.) seeing the discipline as connected to themselves, their communities and their histories, and d.) seeing the discipline as a way to understand, critique and transform society?

2. How does classroom culture, particularly certain norms and practices, afford or constrain the development of student success?

3. How does teacher learning about norms and practices help teachers (re)negotiate classroom culture to promote student success?

- Section 2: **Conceptual framework**.

Context

Mobilize: Mobilizing for Innovative Computer Science Teaching and Learning is a targeted National Science Foundation Math Science Partnership. The core partners are: UCLA Graduate School of Education and Information Studies (Center X), the Los Angeles Unified School District (LAUSD), the UCLA Center for Embedded Networked Sensing (CENS), and the Computer Science Teachers Association (CSTA).

Mobilize builds on teenagers' engagement, creativity and dexterity with mobile technology. At the heart of Mobilize is the CENS Participatory Sensing system - an innovative method of data collection and analysis in which students use mobile phones and web services to systematically collect and interpret data about issues relevant to them and collective causes with which they identify. These data and analyses are augmented with other data sets and analysis tools to both deepen and broaden students' investigations.

Mobilize will create hands-on, inquiry-based, curricular units that employ participatory sensing, and, teacher professional development for computer science, mathematics, and science high school classes. Mobilize projects bring together STEM and computational thinking with students' sense of civic involvement in their own communities.

Mobilize is committed to assuring access for innovative instruction, especially in schools with high numbers of African Americans and Latino/a students. Mobilize projects will first be introduced in the Los Angeles Unified School District schools. In LAUSD, interdisciplinary teams of Exploring Computer Science, mathematics, life and physical science, as well as social science students and teachers will work on Mobilize projects. As computer science is now an integral part of innovation across all fields, a goal of Mobilize is to strengthen computer science instruction throughout our educational system.

Mobilize sits at the crux of several critical issues: How can we foster innovation and inventiveness, improve STEM education for students and teachers, and increase access to quality and rigorous education for more students? The insights we gain from Mobilize about increasing opportunities for inquiry-based, rigorous learning of computer science and about innovative teacher professional development, especially in large urban school districts, will be critically important across multiple disciplines, communities, and institutions. Mobilize addresses the centrality of information technologies in our students' lives, for whom a critical view of computing will be increasingly important as they enter the work force and engage as members and leaders of multiple communities.

Classroom Contexts, Student Identity and Student Success

We argue that student success is multidimensional and includes students a.) becoming proficient in the "culture of power" (Delpit, 1995), b.) seeing themselves as capable "doers" and creators of the discipline, c.) seeing the discipline as connected to themselves, their communities and their histories, and d.) seeing the discipline as a way to understand, critique and transform society. These dimensions of student success are most often studied and measured as distinct from each other and without attending to the classroom culture that affords or constrains such success. Drawing on the work of Boaler and Greeno (2000), Cobb and Hodge (2002), Cobb, Gresalfi and Hodge (2009), Jackson (2009), Martin (2009), Nasir and Hand (2006), and Nasir, McLaughlin and Jones (2008), we therefore employ identity as a lens to study how these dimensions co-construct each other. We also examine how classroom cultures afford and constrain the development of such student identity. Building on Cobb and Hodge (2002), we attend to three aspects of the classroom micro-culture that shape student identity and that can be operationalized: classroom social norms, social norms particular to a discipline, and classroom practices particular to a discipline. This operationalization of classroom culture will be instrumental in our professional development with teachers as it provides a lens to examine how teachers can (re)negotiate classroom culture for student success.

Research Hypothesis

Through Mobilize, students will engage in an innovative method of data collection and analysis in which they use mobile phones and web services to collect and interpret data about issues important to them and their communities. Students will learn about the nature of data, including its representation, formats, and protocols for sharing as they explore real-world issues that are often difficult to define and involve some uncertainty. In addition to conventional statistical approaches, Mobilize will also emphasize the use of

computational thinking as students work with and understand such data. Mobilize will also promote problem-solving and interdisciplinary collaboration as it creates a context for students to work at the intersection of mathematics, science, computer science and civic engagement.

We hypothesize that Mobilize's innovative approach to engaging students in real-world, self-authored campaigns that make data collection and interpretation relevant to individual students and their collective causes, will facilitate classroom norms and practices that promote student success as outlined above.

- Section 3: **Explanatory framework**.

We will focus on a subset of Mobilize classrooms for in-depth study. The sample will include teachers with a range of teaching experience. Based on an assessment of their participation in the summer professional development before the implementation of Mobilize in their classrooms, we will ensure a range of teachers with varying levels of confidence and optimism about their ability to co-construct classroom cultures that utilize Mobilize to develop student identities that embody the dimensions of student success outlined above.

Currently our research program is focused on developing the theoretical framework and data protocols to investigate identity as a lens to study student success as defined above and classroom culture, particularly certain norms and practices, as affordances or constraints to the development of student success. This work will inform our professional development program this summer, our collection and analysis of data next year in Mobilize classrooms, and our analysis of how teachers' learning trajectories, within the context of a university professional development and within the specificities of their school context, help them (re)negotiate classroom culture to promote student success.

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